PATENT APPLICATION
DOCKET NO. 3157

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTOR(S):	Brian Bandhauer	
SERIAL NO.:	10/715,342	GROUP ART UNIT: 3662
FILED:	November 16, 2003	EXAMINER: Lobo, Ian J
SUBJECT:	Radar Frequency Hopping	

APPLICANT'S INVENTOR'S DECLARATION UNDER 37 CFR 1.132

Now comes Brian D. Bandhauer, inventor for the subject patent application, and he declares:

1. That he is a citizen of the United States, and resides at 3774 W. Pine Creek Court, Meridian, ID 83642;

2. That he is the inventor for the above-identified patent application;

3. That his higher education may be summarized as follows:

   a. **B.S. Degree, Engineering Physics, Colorado State University (1985)** Specialization in Electronics Engineering Physics. Cum. GPA: 3.10, Major GPA: 3.56; and

   b. **M.S. Degree, Electrical Engineering, University of Colorado (1989)** Specializations in electromagnetics and optical electronics Thesis: "Coupled Transmission Line Model for Rectangular Microstrip Patch Antennas Coupled Along Non-Radiating Edges". Advisor, Dr. Kuldip C. Gupta. GPA: 3.67.

4. That his career in the field of electrical engineering may be summarized as follows:

a. **Senior RF Electrical Engineer, Preco Electronics**
Boise, ID (August 2000 - Present)
Senior R&D engineering position focusing primarily on low-power (1 μW) object detection radar systems using a direct RF-carrier-to-time-domain downconversion technology (a form of digital sampling). Preco patented one of the first back-up alarms and specializes in innovative safety products for the commercial vehicle industry.

b. **Director of Hardware Development / Senior Electrical Engineer, Acres Gaming**
Corvallis, OR, and Las Vegas, NV (May 1996 – August 2000)
Managed small hardware engineering group (promoted to Director in August 1999) consisting of one other senior electrical engineer, a senior electrical CAD designer, a mechanical engineer, and a senior documentation specialist.

c. **Contract Engineer, BDB Engineering**
Self Employment since January 1991 (1.5 years full-time & occasional sideline work since then)
Electronic design experience includes several PIC and Motorola microcontroller projects: remote controlled motorized shade system; multiple channel audio console with intelligent AGC amplifiers; a long-life battery powered door-monitor alarm, nighttime electroluminescent address display with solar-powered battery recharger, a miniaturized stun gun in flashlight housing for police use, and theoretical investigation of methods for building a personal velocity meter device.

d. **Senior RF Engineer, Celwave RF** (formerly known as Janel Laboratories, Inc.)
Corvallis, OR (June 1992 - May 1996)
RF, analog, and digital electronics product and system design for cellular telephone cell-site and base-station related products.

e. **Engineer, Science and Engineering Associates, Inc. (SEA)**
Seattle, WA (October 1989 - January 1991).
Staff scientist/engineer providing science and engineering services on a contract basis that covered a diverse range of RF, analog and digital products & systems.

f. **Engineer, Erbtec Engineering, Inc.**
Boulder, CO (July 1988 - Oct. 1989)
Staff engineer responsible for production improvements in a 200 watt RF pre-amp subassembly used in a microcontroller 20 kilowatt magnetic resonance imaging amplifier, and

g. **Engineer, Phasar Corporation**
Lakewood, CO (January 1988 - July 1988)
Designed and implemented second-generation improvements in a 256-element, 12 GHz, microstrip planar antenna array, and empirically determined the effective dielectric constant for the materials used in this company's unique, patented microstrip process;

5. That he is therefore well acquainted with the field of radar systems, including radar systems that provide improved co-locatability and reduced signal interference;

6. That he has read and approved the subject patent application and currently-pending claims;

7. That he has read the Examiner's Action in this case mailed June 5, 2006, including the cited Aiello (U.S. Patent #6,430,211), Litchford (U.S. Patent #3,757,324), and Larrick, Jr., et al. (U.S. Patent #6,690,741) references;

8. That he does not agree with the Examiner that the level of skill in the relevant art is a masters or above degree in electrical or mechanical engineering;

9. Instead, that he works with several competent designers who have associate degrees in electricity/electronics, plus 4-10 years industrial design experience, and he considers them to be at the level of ordinary skill in the art.

10. That, regarding the Examiner's rejection that some of the claim terms are not supported by the original description, he specifically states:

a. He understands that the Examiner indicates that the original invention specification does not disclose a wideband transmitter, wideband receiver with a narrow interference bandwidth, a self-contained radar, and synchronized adjustment of transmit and receive clocks.

b. In rebuttal, he states that:

i. Page 8, Line 3, states that the preferred embodiment is a TDDC radar. The entire section, "Related Art", describes and **defines** what a TDDC radar is as disclosed by McEwan in several noted patents. This definition of TDDC radar as described in the patent application thereby discloses to one skilled in the art a wideband transmitter, wideband receiver, a self-contained radar unit, and synchronized transmit (Tx) & receive (Rx) clocks.

ii. Page 8, Lines 5 - 16, describe the TDDC radar transmitter in detail. For those skilled in the art, the disclosed McEwan patents would be understood to teach the details of the radar transmitter beyond the application description on page 8. The transmitter portion of the invention, by itself, is already defined in prior art.

iii. Page 8, Lines 17 - 29 describe the TDDC radar receiver in detail. Again for those skilled in the art, the disclosed McEwan patents would be understood to teach the details of the radar receiver beyond the application description on page 8. The receiver portion of the invention, by itself, is already defined in prior art.

iv. Page 5, Line 19, states that potential interference is "very narrowband", and Lines 20-21 quantify it.

v. Page 6, Lines 17 - 18 repeat that interference is very narrowband in nature.

vi. Page 5, Line 13, states that transmit and receive clocks are synchronized.

vii. Page 5, Lines 22 - 27, describe the dithering approach of TDDC devices, which explicitly states that the clocks are synchronized (coherent).

viii. Figures 1 & 2 show that the transmit & receive clocks source from the same component and must therefore be synchronized, and are also thereby adjusted in synch.

ix. Page 9, Line1, states that each sample is phase-coherent. This teaches that the transmit and receiver clocks are synchronized (in-phase, or coherent) to those familiar with a TDDC radar system.

x. Page 9, Lines 15-18, describe Figure 1 and state that the system comprises a transmitter and receiver clock. For those skilled in TDDC radar, it is understood that the clocks must therefore be synchronized.

11. That, regarding the Examiner's rejection that the 3 (three) cited prior art patents make the claims obvious, he specifically states:

a. The Aiello patent utilizes frequency hopping of a "baseband transmitter" (pulsed UWB transmitting device) that regularly changes its pulse repetition frequency (hops the PRF) for the purpose of minimizing interference to **other** kinds of devices (non UWB radio receivers). Only the transmitter is adjusted and there is no reference to radar at all, only communications devices. A person designing a TDDC radar would not view the Aiello patent as relevant to a TDDC system operation.

b. The Litchford patent discloses the use of varying PRF in aircraft traffic control systems to introduce a special proximity code signal that may be interpreted as intelligent data within existing systems to aid in control of air traffic. This invention does not in any way relate to the present invention other than the PRF is manipulated. Also, this invention does not in any way relate to the disclosures of the Aiello or the Larrick patents.

c. The Larrick patent includes PRF manipulation of UWB transmitters for the purpose of carrier frequency control, and/or spectral content control of the **transmitted** signal. It does not in any way relate to TDDC radars, nor the purpose of using PRF manipulation for the possibility of improved co-location or interference rejection in TDDC or any other kind of radar. This Larrick patent is specifically intended as a new approach to UWB transmission only, and does not in any other way relate to the disclosures of the Aiello or the Litchford patents.

12. That, further regarding the Examiner's obvious rejection, he specifically states:

a. All the 3 (three) cited references are non-analogous to the present invention in the sense they do not relate to the same technical field, nor the same problem to be solved, nor the same way of solving the problem as the present invention, nor the other cited references; and

b. Even if the teachings of all three (3) cited references are combined, which is not logical, they still do not disclose or suggest the features of the present invention wherein a TDDC radar is a self-contained detector, with transmit and receive clocks synchronized by the same frequency variable oscillator.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Further Declarant saith not:

Signed: _____ Date: _____

Brian D. Bandhauer
Inventor

signature page attached
11/6/06

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Further Declarant saith not:

Signed: _____ Date: 11/06/06

Brian D. Bandhauer
Inventor